BITSAT 2026 May 24 Shift 1

Question Paper (Memory-Based)

Conducted by BITS Pilani

General Instructions

(i) **Duration:** The total duration of the examination is 3 hours (180 minutes).

(ii) **Total Marks:** The complete paper carries a maximum of 390 marks.

(iii) **Structure:** The paper has 4 Sections:

- **Part 1:** 30 Multiple Choice Questions (Physics).
- **Part 2:** 30 Multiple Choice Questions (Chemistry).
- **Part 3:** 10 Multiple Choice Questions (English Proficiency), 20 Multiple Choice Questions (Logical Reasoning)
- **Part 4:** 40 Multiple Choice Questions (Mathematics/Biology)

(iv) **Compulsory Questions:** All 130 questions are compulsory,and +12 Questions(Optional Extra Questions)

(v) Each question has four options. Only **one** option is correct.

(vi) **Correct Answer:** +3 marks.

(vii) **Incorrect Answer:** −1 (Negative marking).

(viii) **Unanswered/Marked for Review:** 0 marks.

PHYSICS

1. Two point charges $+q$ and $-q$ are held fixed at a distance d apart. The net electric potential at a point midway between the two charges and its net field are?

(A) $E = 0 \quad V = 0$

(B) $E \neq 0 \quad V \neq 0$

(C) $E = 0 \quad V \neq 0$

(D) $E \neq 0 \quad V = 0$

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2. A charge Q is placed at the center of an uncharged conducting spherical shell of inner radius R_1 and outer radius R_2. The surface charge density on the outer surface of the shell is:

(A) $\frac{Q}{(4\pi R_1^2)}$

(B) $\frac{Q}{(4\pi R_2^2)}$

(C) $\frac{-Q}{(4\pi R_1^2)}$

(D) Zero

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3. A parallel plate capacitor is charged and then disconnected from the charging battery. If the plates are now pulled further apart using insulating handles:

(A) The charge increases

(B) The voltage decreases

(C) The capacitance increases

(D) The electrostatic energy stored increases

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4. The magnetic field at the center of a circular current-carrying loop of radius R is B_0. The magnetic field at an axial point at a distance $x = R$ from the center of the loop is:

(A) $B_0/2$

(B) $B_0/2\sqrt{2}$

(C) $B_0/4$

(D) $B_0\sqrt{2}$

CHEMISTRY

5. The value of enthalpy change (ΔH) for the reaction $\mathbf{C_2H_5OH}(l) + 3\mathbf{O_2}(g) \rightarrow 2\mathbf{CO_2}(g) + 3\mathbf{H_2O}(l)$, at 27°C is -1366.5 kJ mol^{-1}. The value of internal energy change for the above reaction at this temperature will be

(A) -1371.5 kJ mol^{-1}

(B) -1369.0 kJ mol^{-1}

(C) -1364.0 kJ mol^{-1}

(D) -1361.5 kJ mol^{-1}

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6. For the complete combustion of ethanol, $C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$, the amount of heat produced as measured in bomb calorimeter is 1364.47 kJ mol^{-1} at $25°$C. Assuming ideality the enthalpy of combustion, ΔH_C, for the reaction will be (R $= 8.314$ JK^{-1}mol^{-1})

(A) -1366.95 kJ mol^{-1}

(B) -1361.95 kJ mol^{-1}

(C) -1460.50 kJ mol^{-1}

(D) -1350.50 kJ mol^{-1}

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7. What is $[NH_4^+]$ in a solution that is 0.02M NH_3 and 0.01 M KOH? $[K_b(NH_3) = 1.8 \times 10^{-5}]$

(A) 3.6×10^{-5} M

(B) 1.8×10^{-5} M

(C) 0.9×10^{-5} M

(D) 7.2×10^{-5} M

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8. 1.1 mole of A mixed with 2.2 moles of B and the mixture is kept in a 1 L flask and the equilibrium, $A + 2B \rightleftharpoons 2C + D$ is reached. If at equilibrium 0.2 mole of C is formed then the value of K_c will be

(A) 0.1

(B) 0.01

(C) 0.001

(D) 1

MATHEMATICS

9. If $y^x = e^{y-x}$, then $\frac{dy}{dx}$ is equal to

(A) $\frac{1+\log y}{y \log y}$

(B) $\frac{(1+\log y)^2}{y \log y}$

(C) $\frac{1+\log y}{(\log y)^2}$

(D) $\frac{(1+\log y)^2}{\log y}$

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10. The domain of the function $f(x) = \sqrt{x - \sqrt{1-x^2}}$ is

(A) $\left[-1, -\frac{1}{\sqrt{2}}\right] \cup \left[\frac{1}{\sqrt{2}}, 1\right]$

(B) $[-1, 1]$

(C) $\left(-\infty, -\frac{1}{\sqrt{2}}\right] \cup \left[\frac{1}{\sqrt{2}}, +\infty\right]$

(D) $\left[\frac{1}{\sqrt{2}}, 1\right]$

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11. If A and B are symmetric matrices of same order such that $\mathbf{AB + BA = X}$ and $\mathbf{AB - BA = Y}$, then $\mathbf{(XY)^T} =$

(A) XY

(B) $X^T Y^T$

(C) $-YX$

(D) $-Y^T X^T$

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12. Let $\mathbf{A} = \{1, 2, 3, 4, 5\}$ and R be a relation defined by $\mathbf{R} = \{(x, y) : x, y \in \mathbf{A}, x + y = 5\}$. Then, R is

(A) reflexive and symmetric but not transitive

(B) an equivalence relation

(C) neither reflexive nor transitive

(D) neither reflexive nor symmetric but transitive
